DOCUMENT RESUME

ED 373 344 CS 214 468

AUTHOR Baer, Matthias; And Others
TITLE How Do Expert and Novice Writers Differ in Their Knowledge of the Writing Process and Its Regulation (Metacognition) from Each Other, and What Are the Differences in Metacognitive Knowledge between Writers of Different Ages?
PUB DATE Apr 94
CONTRACT 11-27673-89
NOTE 44p.; Paper presented at the Annual Meeting of the American Educational Research Association (75th, New Orleans, LA, April 4-8, 1994) and the European Association for Research on Learning and Instruction Conference (5th, Aix-en-Provence, France, August 31-September 5, 1993).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Adolescents; Adults; Comparative Analysis; Foreign Countries; Intermediate Grades; *Metacognition; Secondary Education; Writing (Composition); *Writing Achievement; *Writing Processes; Writing Research
IDENTIFIERS Collaborative Writing; Switzerland

ABSTRACT

A study diagnosed the nature of different text production abilities of Swiss grade 5 and grade 9 students, and of adults, and diagnosed good and poor writers' differences within each of these three age groups. Subjects, 36 in all, were uniformly divided between 11- and 15-year-old students from the Bernese secondary school and high school teachers. The 12 subjects of each age group were made up of six good and six poor text writers. Each subject worked with an additional person as a pair. Each pair was given the task of writing an article about the art and personage of a well-known Swiss iron-sculptor. The "tutor" guided the "tutee" through the task of writing the text. The tutee had to follow the tutor's advice and was responsible for the formulation and writing down of the surface structure sentences. Subjects were videotaped as they wrote the text. Results indicated that the most dominant factor for the differences among subjects was the age factor. On the whole, the subjects from grade 5 and grade 9 were generally far more similar than expected. Grade 9 subjects, who have almost finished school, did not seem to possess a well-developed metacognitive knowledge base for writing compared to that of the adult subjects. (Contains 17 figures illustrating various aspects of data gathering, correlation analyses, and the model underlying the research.) (RS)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 373 344

OHP Transparency 0: Title of Contribution with Names and Institutional Affiliation

How Do Expert and Novice Writers Differ in Their Knowledge of the Writing Process and Its Regulation (Metacognition) From Each Other, and What Are the Differences in Metacognitive Knowledge Between Writers of Different Ages? [1]

Matthias BAER, Armin HOLLENSTEIN, Margaretha HOFSTETTER, Michael FUCHS & Monika REBER-WYSS, Department of Pedagogical Psychology, University of Berne, Switzerland [2]

Abstract:
This study is a diagnosis of the nature of different text production abilities of grade 5 and grade 9 students, and of adults. It is further a diagnosis of good and poor writers' differences within each of these three age groups. More specifically, this study investigates the following: (1) How do younger and older writers differ from each other in their metacognitive knowledge of writing? (2) What are the differences in metacognitive knowledge between good and poor writers in each of the three age groups? The study also gives (3) an idea of how the metacognitive knowledge of writing develops from grade 5 to grade 9 and in adult writers. In addition, it provides (4) insights into the understanding and management of the writing processes of regular school students. Results of this kind should be considered in intervention programs aimed at improving students' writing abilities.

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
M. Baer
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Overview:
The study is part of a three year research project which is supported by the Swiss National Science Foundation (Grant # 11-27673.89). It is a cognitive-psychological study and deals with metacognitive aspects of writing. The aim of the project is:

OHP Transparency 1: The Three Parts of the Project

CS214468

[1] Paper presented at 5th Conference of European Association for Research on Learning and Instruction, Aix-en-Provence, France, August 31 - September 5, 1993.

[2] The authors gratefully acknowledge the contribution of Erja BAER-HEIKKILÄ, Sam HIRSBRUNNER, Martin STADELMANN, and Susanne RÜEGG.

BEST COPY AVAILABLE

1) to further develop a constructive structural model of writing (theoretical part);

2) to analyse the production process related cognitive and metacognitive abilities of writing which school students of different ages and adults have (analytical part), and

3) on the basis of 1) and 2) to develop a cognitive and metacognitive intervention program to foster students' ability to write texts (intervention part).

Today, we concentrate on the analytical part of the study. In as far as it is necessary to understand this, we will also deal with the theoretical part. The intervention will not be dealt with. In the analytical part of the project we investigated the following two questions:

OHP Transparency 2: The Two Questions for Analysis

1) How do younger and older writers differ in their self-regulatory knowledge of the writing process (metacognition) and in their knowledge of the characteristics of text products (text organization)? This is what we call diachronical comparison.

2) How do good and poor writers differ in their self-regulatory knowledge of the text production process and in their knowledge of the characteristics of text products? This is what we call synchronical comparison.

The investigation is therefore based on a 2 x 3 factors design.

OHP Transparency 3: 2 x 3 Factors Design

Theoretical Framework:
In the last one and a half decades the expert-novice research in various academic fields has discovered considerable differences in metacognitive knowledge between subjects of higher and lower abilities. To mention just very few, in writing research BEREITER & SCARDAMALIA's (1987) distinction between so-called "knowledge telling" and "knowledge transforming" is a well-known characteristic differentiating novice and expert writers. Despite being a well-known distinction it can, however, hardly obscure the fact that it only identifies differences between good and poor writers in a very general way: Novices write associatively, following the model "and then". They report, as it were, everything that comes into their mind concerning a particular topic, hence the term

"knowledge telling". Experts, on the other hand, apply their knowledge to create new structures. In this way they alter existing structures or transform their knowledge as the term "knowledge transforming" conveys.

The American research group associated with ENGLERT and RAPHAEL (ENGLERT et al.(1989)) then investigated the metacognitive knowledge of writing in school students of different text production abilities. Their comparison of learning disabled, low-achieving and high-achieving school students points out clear distinctions between the three different student groups. It is mainly the learning disabled students, who write clearly qualitatively poorer texts, who are distinguished by less comprehensive and less developed metacognitive knowledge. Similar differences, though to a lesser degree, exist between low-achieving and high-achieving students.

Although the research done by ENGLERT and RAPHAEL extends our understanding of different writing abilities, we still do not fully know the reason for the existing differences in the ability to write texts. In particular, we know little about the differences which exist between good and poor writers in a normal class concerning the knowledge how the complex problem of writing a text can be overcome. We can also say little about the sort of metacognitive knowledge adults have at their disposal and whether differences exist between adults who are professionally engaged in writing and those who are not. In our opinion, analyses, just like the one presented here, are necessary for the development of intervention programs - and later for their application in schools.

A text production model is also part of the theoretical framework of our analysis. We will now briefly explain this model in order to give an idea which parts of the task have to be carried out and co-ordinated with each other in the course of a text production process.

OHP Transparency 4.0: Orchestra Model of Text Production

This model consists of four main components, a test component as well as an executive component.

The "executive" component co-ordinates the main and test components in such a way that it activates the components in an appropriate way. It has a wide range of knowledge concerning the ideal text production process and the text product characteristics at its disposal and makes use of this knowledge as a guiding idealized model for the co-ordination of the components. The components carry out various parts of the functions in the text production process. They are aware of the results of the activities of other

components and can request to be active from the executive component and, if the possibility exists, to intervene with its own function in the continuing process. The components are, however, continually called on by the executive component or, as the case may be, activated through this. The activities of the components do not take place in the chronological order of the description presented here, but are to be seen as a complex to and from between them. This can be established from the comparison of available and targeted results through the executive.

OHP Transparency 4.1: Enlarged Section of "Task Analysis" and "Construction of the Semantic Deep Structure"

The component "task analysis" analyses the text production task with regards to the pregiven requirements and conditions to produce the text. It specifies the text production task concerning its intentions of effect, its addressee reference, its text organization as well as its rhetorical-stylistic characteristics and determines a detector model or text anticipation which schematically anticipates the text which is to be produced (SELZ 1913, 1922; DUNCKER, 1935).

The component "construction of the semantic deep structure" constructs the deep structure which semantically constitutes the text. It does this by recalling suitable semantic elements (idea generation) on the basis of the text anticipation from internal (memory) and external stored knowledge (illustrations, books, media etc.). It then links these elements with one another with the aid of appropriate relation concepts. The result is a hierarchically organized network of semantic set-in-relations which are composed of micro and macro structures and the superstructure which combine these structures and represents the "message" of the text.

OHP Transparency 4.2: Enlarged Section "Language Coding/Formation of the Surface Structure" and "External Representation"

The component "Language Coding/Formulation of the Surface Structure" has two functions. On the one hand, it determines the order of thoughts for the linear surface structure of the text which appears in sequences. This we call imposing a chronology. On the other hand, it generates the correct, rhetorical-stylistic suitable, (etc.) syntax of the text. This subfunction we call syntactising. The components, in other words, determine how the hierarchical network of semantic set-in-relations, which are formed through

constructive processes, can be brought into a linear sequence and generate the linguistic surface of the text so that sentences are formed. The result of imposing a chronology is a list of hierarchically ordered propositions. The result of syntactising is the cohesive linguistic text surface.

The component "external representation" represents the results of the activity of other components externally. It presents, for example, the result of the relational linking of the construction of the semantic deep structure in a network type of form, adheres to the result of the imposition of chronology a hierarchical list of micro and macro propositions or represents the result of the syntactising as a sequence of linguistic surface sentences.

OHP Transparency 4.3: Enlarged Section "Test Component"

The "test component" examines, in a variety of ways, whether conditions which have been attained at that point and those to be attained correspond: a) Does the text anticipation correspond to the text production task in question? b) Does the constructed semantic deep structure conform to what the text anticipation requires? c) Does the generated surface structure of the text really express the semantic deep structure? d) Does the graphical text representation render the surface structure correctly in a written form? e) Does the generated text correspond to the text anticipation and thereby the original writing task? The result of the investigation at this particular point is transmitted to the executive which makes use of this information when determining the future course of the text production processes.

The model consists of three further components, namely the components "fact clarification", "emotional/motivational state" and "internal representation".

OHP Transparency 4.4: Enlarged Section "Cognition" and "Self-Perception"

In connection with text production, it may be necessary to clarify facts which have become a cognitive problem. In this situation the executive brings the text production process to a halt and activates the component "fact clarification". This clarifies the cognitive structure of the misunderstanding or, as the case may be, the problematic facts. Then, the executive sets the text production process in motion again. The "fact clarification" component, strictly speaking, does not belong to the text production process. It is a component which also functions outside text production processes. It always goes into action if the cognitive structure of a thing or fact has become a problem.

The component "emotional/motivational state" becomes active similar to "fact clarification" not only in connection with the text production process, but also when a cognitive activity acts on affective aspects. The existing "emotional/motivational state" is transmitted to the executive. This decides what measures have to be taken and interrupts, for example, the text production process in order to recuperate.

OHP Transparency 4.0: Orchestra Model of Text Production

Finally, we consider the component "internal representation" as covering the area of mental activity which involves the internal storage and recalling of elements and structures of knowledge.

Just as the art of playing well together exists in an orchestra in order to interpret music in well co-ordinated interaction between the musicians and the conductor and in the disciplined collaboration of individual musicians, so the crucial point in the outlined text production model exists in the sensible co-ordination of individual main components among themselves and through the executive in order to generate the text product. Relating to this metaphor, it is comprehensible to speak about an "orchestra model of text production".

We now turn to the analytical part of the study.

OHP Transparency 5: Experimental Design

Experimental Design:
All in all, 36 subjects took part in this study. They are uniformly divided between 11 and 15 year old school students from the Bernese secondary school (which is attended between the ages of 11 - 16) and adults. The twelve subjects of each age group were made up of six good and six poor text writers. In the student group the group of good writers was formed from the three best writers from each of two parallel classes. The three poorest writers from each of these classes were combined to make up the group of poor writers.

High school teachers co-operated in being the adult subjects. In this group the division into experts or novices depended on whether the subject was professionally involved in writing texts or not. Those high school teachers who taught their mother-tongue language German formed the expert group. Novices consisted of high school teachers

who did not teach German and therefore were not professionally involved in text production. However, they were academically trained like the experts.

For the data collection we made use of the so-called Turku-table.

OHP Transparency 6: Experimental set up: Turku-table

This table was developed at the Institute of Education of the University of Turku in Finnland, and was used in reading research. It is a specially constructed table with a glass surface and a slightly forward tilted mirror underneath this glass surface. A video camera is positioned in front of the mirror so that pictures of a person writing at this table while sitting at the opposite end of the table's camera-side can be taken as well as pictures of what the person is writing on the sheet of paper lying on the glass surface.

Each subject worked with an additional person as a pair in the experiment. For the school student subjects this was a fellow student who was known but didn't belong to the subject's class. For the adult subjects the additional person originated from a higher level class of the school (teacher training college) in which the adult subject taught. Different roles were assigned to the two people of each pair: the subject became the tutor, the additional person the tutee. Each pair were given the task of writing an article about the art and personage of the well-known Swiss iron-sculptor, Berhard Luginbühl, for a school or daily newspaper.

OHP Transparency 5: Experimental Design

The tutor and tutee had various functions as a consequence of the allocated roles: the tutor, the actual subject, had to (as senior reporter) guide the tutee (as junior reporter) through his/her task of writing a text. The tutee, on the other hand, had to follow the tutor's advice and was responsible for the formulation and writing down of the surface structure sentences. By organising, guiding, monitoring and giving his/her opinion on the results generated, the tutor took charge of the metacognitive or self-regulatory functions. The tutee, on the other hand, was responsible for various cognitive functions in the text production process.

A twelve minute video film about the iron-sculptor Bernhard Luginbühl and his art was shown in order to give the subjects common content subject matter. In addition, each pair received six pictures of Luginbühl himself and of some of his best known works.

OHP Transparency 7a: Colour Picture "Luginbühl with Butterfly-Screw on his Head"

OHP Transparency 7b: Colour Picture of One of Luginbühl's Iron Sculptures

(possibly only Transparency 7b shown)

The video film was shown to the tutor and tutee prior to their carrying out the text production task together. It was prepared in such a way that, although it contained clear content material, it did not have any structured order of sequences to make a simple retelling of the events in the film possible. In the joint session of tutor and tutee the video film was no longer available. However, the tutor and tutee could look at the six pictures of Luginbühl and his work again at any time.

OHP Transparency 8: Chronological Arrangement of the Experiment

In the first session the tutor himself wrote an informative text about Luginbühl and his work. In the second session with the tutee he could therefore, corresponding to his function, concentrate on the metacognitive aspects of the text production process and guide the tutee through the text production process. The video film about Luginbühl and his art was also shown to the tutee before the session with the tutor. The tutee, however, had no opportunity to write his/her own text before the session together. He/She was therefore encouraged to follow the advice of the tutor in the session with him/her.

We name the process described here as data collection based on diadic instruction. The so-called tutor doesn't solve the problem him/herself, but instructs the tutee step by step with the aim of enabling him/her to solve the problem. In order to do this, the tutor has to fall back on his self-regulatory knowledge of the text production process, as well as his/her own ideas on the characteristics of text products. It is of interest to note what advice of a process and product related type the tutor gives the tutee or how the tutor guides the tutee through the text production task.

It was possible, with the technical apparatus described, to tape on video the problem solving dialogue between the tutor and tutee at the same time as the notes and text were written down by the tutee. The session of a tutor/tutee pair lasted up to 90 minutes.

OHP Transparency 9: System of Categories

The 36 video tapes were transcribed. Then the statements of the tutor in each transcript were analysed into propositions. Each proposition was assigned one of 32 categories of a system of categories which was developed on the basis of our theoretical concepts and the empirical data collected.

Results:

Diachronical Comparison

On the whole, adult and student subjects significantly differ from each other in more than 20 out of the 27 relevant categories of our category system, for example concerning (1) the analysis of the writing task, (2) the construction of the semantic deep structure of the text, (3) the imposing of a chronology on the constructed semantic deep structure, (4) the test operations for evaluating the quality of the results of different writing subprocesses, and (5) the different kinds of external representations of the results of these subprocesses. Other differences concern (6) the way in which tutors organize their writing process, and (7) whether they take emotional and motivational aspects into consideration during the writing process.

Correlation Analysis: Age and Categories

a) Ability: Good Writers
Age: Grade 5, Grade 9, Adults

OHP Transparency 10: Correlation Analysis: Age and Categories
Subjects: Good Writers of Grade 5, Grade 9, Adults

b) Ability: Poor Writers
Age: Grade 5, Grade 9, Adults

OHP Transparency 11: Correlation Analysis: Age and Categories
Subjects: Poor Writers of Grade 5, Grade 9, Adults

The two student subject groups are altogether far more similar . They differ from each other mainly in the attention that is paid to (1) the formulation, (2) the revision of surface-sentences, and (3) the revision of written text representation, as well as in relation to a

few aspects of (4) the task analysis and (5) the linking (set in relation) of collected knowledge elements.

Correlation Analysis: Age and Categories

c) Ability: Good Writers
Age: Grade 5, Grade 9

OHP Transparency 12: Correlation Analysis: Age and Categories
Subjects: Good Writers of Grade 5, Grade 9

d) Ability: Poor Writers
Ability: Grade 5, Grade 9

OHP Transparency 13: Correlation Analysis: Age and Categories
Subjects: Poor writers of Grade 5, Grade 9

Synchronical Comparison
Novice and expert adult tutors differ from each other (1) in whether they have the tutee consider the characteristics of the writer's audience, (2) in the kinds of test operation the tutee has to execute, (3) in the hints the tutors gives concerning the formulation of surface-level sentences, and (4) in the tutor's hints concerning the symbolic-iconic representation of generated knowledge elements.

Correlation Analysis: Ability and Categories

a) Ability: Poor and Good Writers
Age: Adults

OHP Transparency 14: Correlation Analysis: Ability and Categories
Subjects: Poor and Good Writers of Adult Subjects

Among student subjects, novice and expert tutors differ from each other in their hints about (1) external sources of information for generating ideas, (2) the hints about formulating surface-level sentences, (3) the revision of surface-level sentences, and (4) the revision of the written text representation, as well as (5) the attention they pay to the

determination of the purpose of the text to be written. However, grade 9 students differ surprisingly little from the subjects of grade 5.

Correlation Analysis: Ability and Categories

b) Ability: Poor and Good Writers
Age: Grade 9

OHP Transparency 15: Correlation Analysis: Ability and Categories
Subjects: Poor and Good Writers of Grade 9

c) Ability: Poor and Good Writers
Age: Grade 5

OHP Transparency 16: Correlation Analysis: Ability and Categories
Subjects: Poor and Good Writers of Grade 5

Conclusion:
Our study aimed at a better understanding of the competences and deficits of writers of different ages and abilities. The most dominant factor for differences among the subjects was the age factor. However, the observed differences are predominantly due to the adults subjects only. Much less important is the ability factor.

On the whole, the subjects from grade 5 and grade 9 are generally far more similar than expected. Grade 9 subjects who have almost finished school do not seem to possess a well-developed metacognitive knowledge base for writing compared to that of the adult subjects. It seems as if students of grade 5 do not gain an elaborated metacognitive knowledge base for writing while moving toward the end of their years at school (grade 9). On the other hand, we also expected more differences between the experts and novices among the adult subjects.

The more we understand the metacognitive knowledge base that writers rely on while tackling writing tasks the better we will be able to design intervention programs which are intended to improve students' problem solving ability in writing. It was the aim of this study to shed more light on this knowledge. The comparison of the results of the student subjects with those of the adult subjects gives an idea about where students' strengths and weaknesses are in coping with writing tasks.

Reference

BEREITER, C. & SCARDAMALIA, M (1987) *The Psychology of Written Composition.* Hillsdale, N.J.: Erlbaum.

DUNCKER, C. (1935) *Zur Psychologie des produktiven Denkens.* Berlin: Springer (1974).

ENGLERT, C.S., RAPHAEL, T.E., FEAR, K.L. & ANDERSON, L.M. (1988) Students' Metacognitive Knowledge About How to Write Informational Texts. *Learning Disability Quarterly,11*, 18-46.

SELZ, O. (1913) *Über die Gesetze des geordneten Denkverlaufs.* Stuttgart: Spemann.

SELZ, O. (1922) *Zur Psychologie des produktiven Denkens und des Irrtums.* Bonn: Cohen.

For more detailled results write to:

Matthias BAER
Abteilung Pädagogische Psychologie (APP)
University of Berne
Muesmattstrasse 27
CH-3012 Berne, Switzerland

e-mail: BAER@APP.UNIBE.CH
fax: 0041 + 31 + 65 37 73

How Do Expert and Novice Writers Differ in Their Knowledge of the Writing Process and Its Regulation (Metacognition) From Each Other, and What Are the Differences in Metacognitive Knowledge Between Writers of Different Ages?

Matthias BAER, Armin HOLLENSTEIN, Margaretha HOFSTETTER, Michael FUCHS & Monika REBER-WYSS

Department of Pedagogical Psychology,
University of Berne, Switzerland

Research supported by the Swiss National Science Foundation, Grant # 11-27673.89

The Three Parts of the Project

1 to further develop a constructive structural model of writing

2 to analyse the production process related cognitive and metacognitive abilities of writing which school students of different ages and adults have and

3 on the basis of 1 and 2 to assist the ability to write texts with the aid of a longer term cognitive and metacognitive intervention programme

Formulation of the Two Questions for Analysis

First Focus: Young vs. Old (diachonical Comparison)

How do younger and older writers

- differ in their self-regulatory knowledge of the writing process (metacognition)

- and in their representation of the characteristics of text products (text organization)?

Second Focus: Novice vs. Expert (Synchronical Comparison)

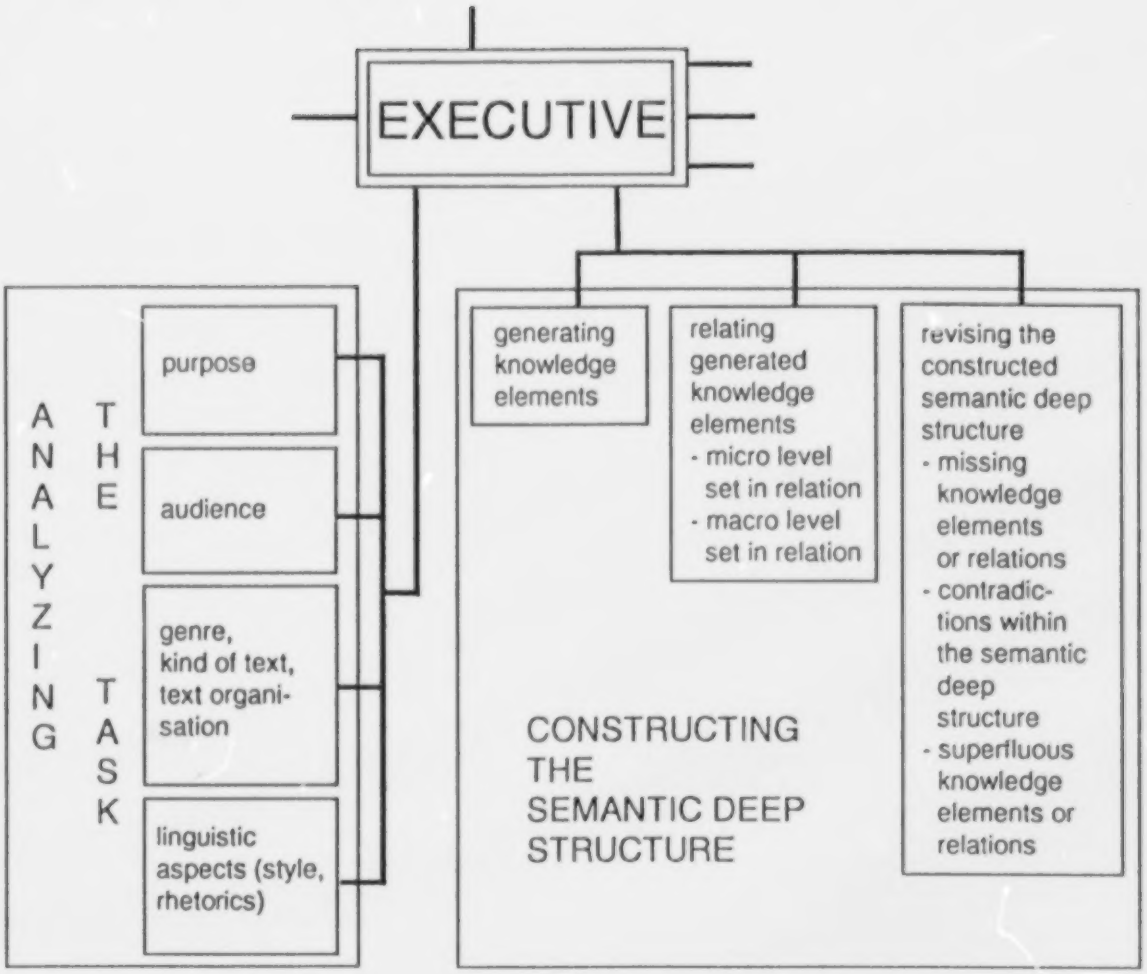
How do good and poor writers

- differ in their self-regulatory knowledge of the text production process

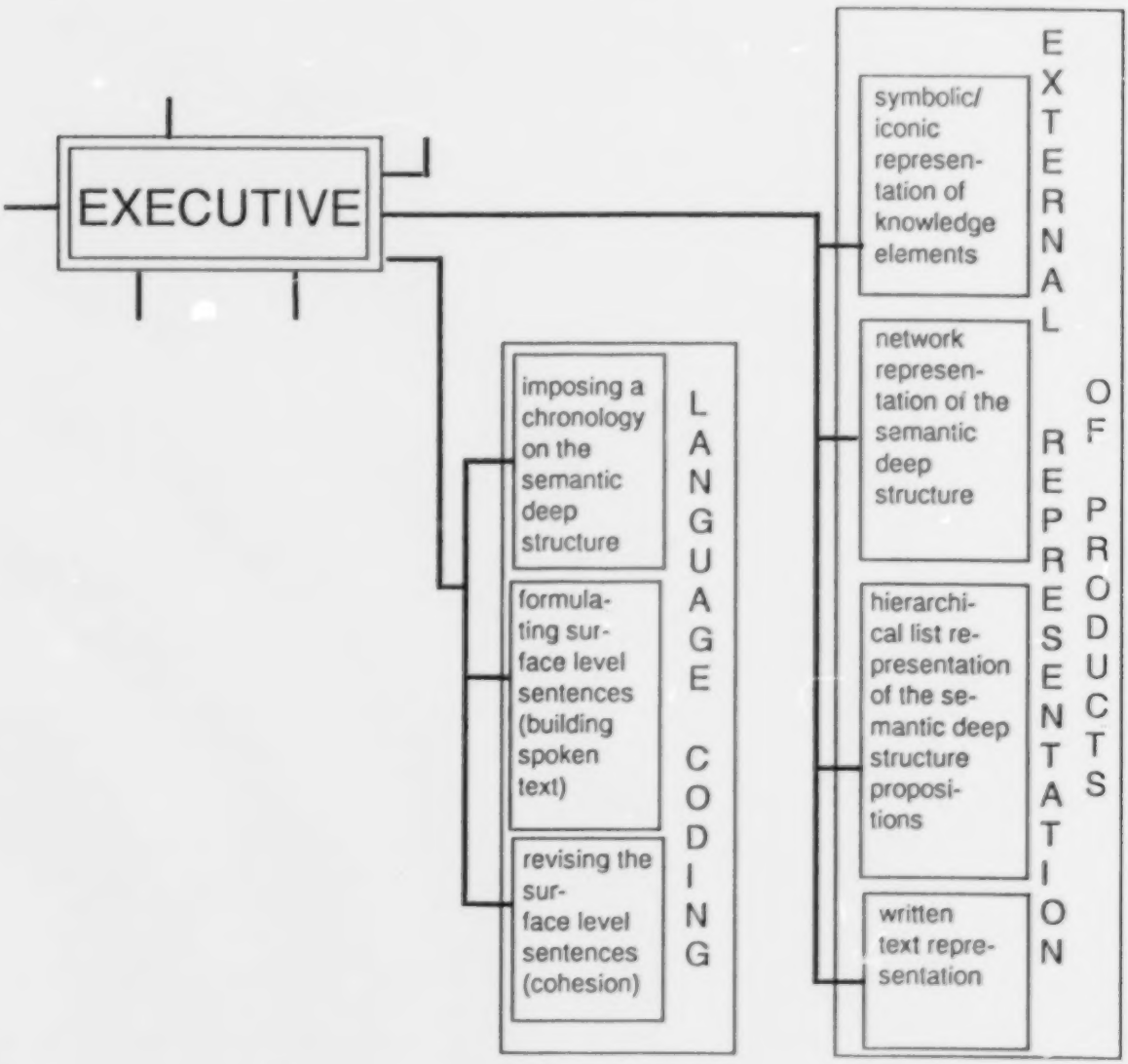
- and in their representation of the characteristics of text products?

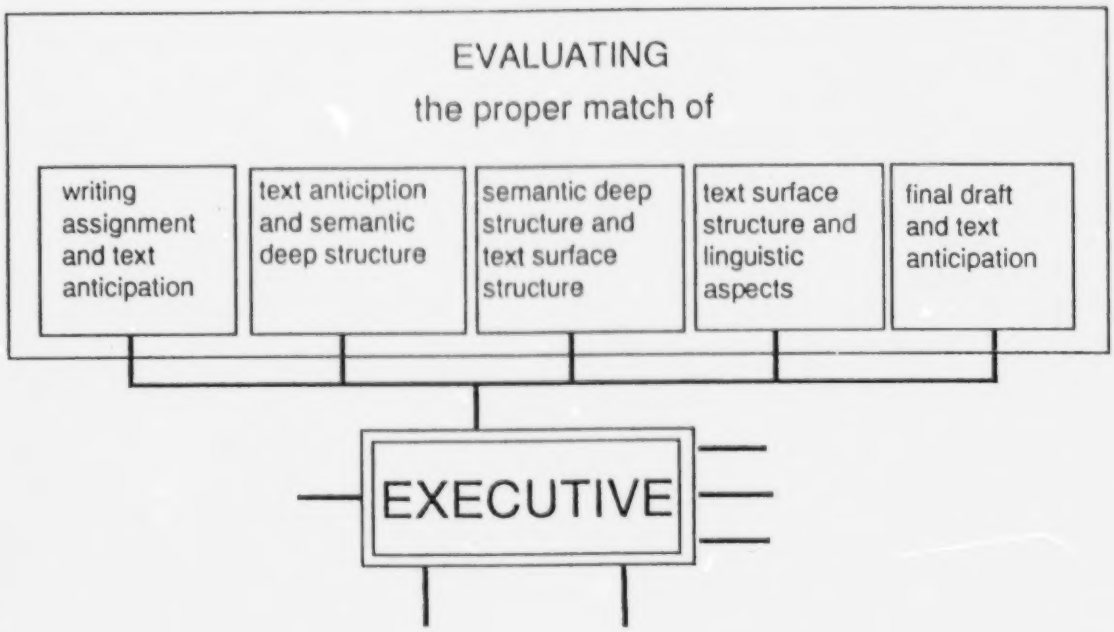
Diagram with 2 x 3 Factors Design

Age	**Ability**	
	Expert writers	Novice writers
11 year old regular school students grade 5		
15 year old regular school students grade 9		
adults		

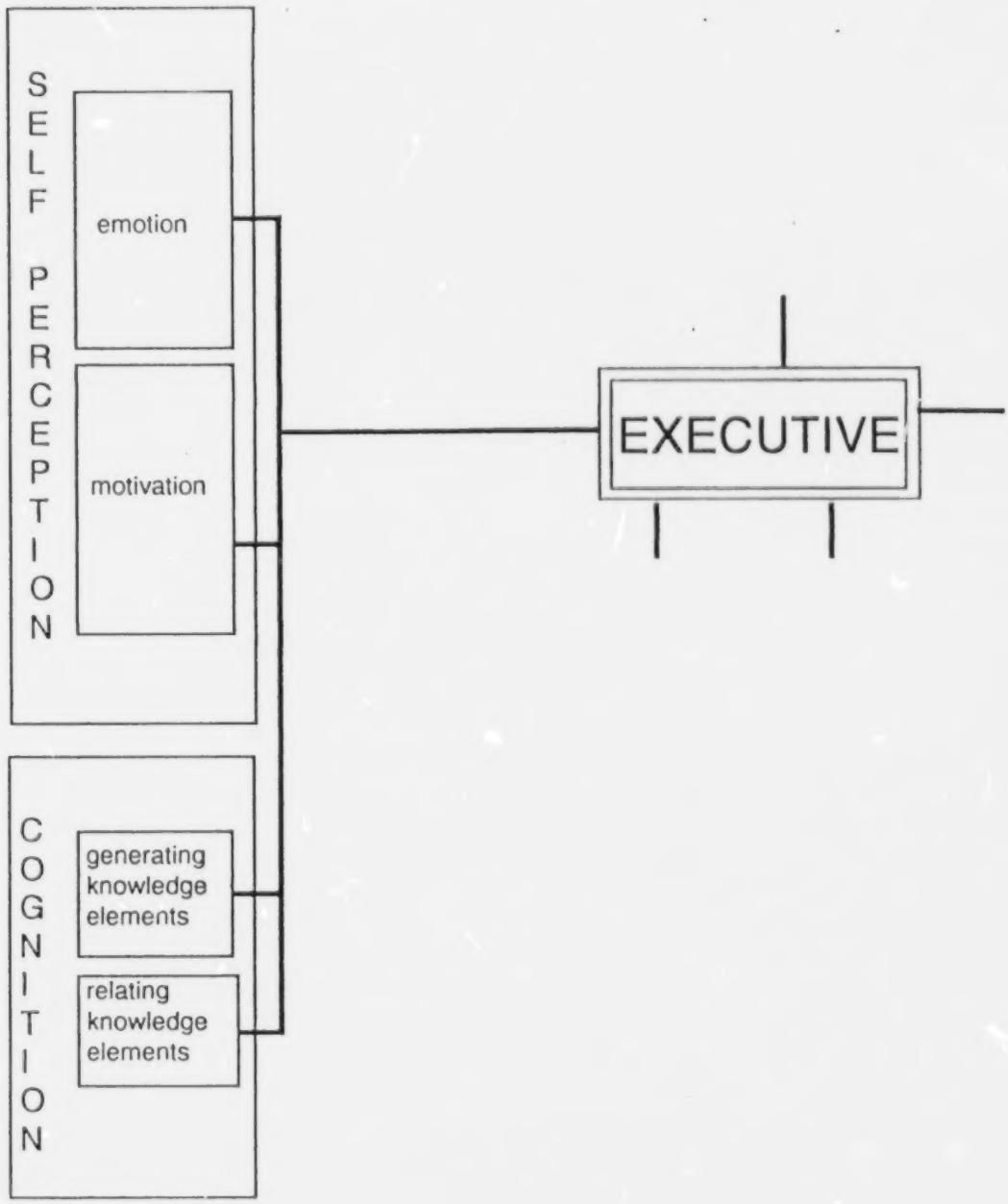

EXECUTIVE
ANALYZING THE TASK
purpose
audience
genre, kind of text, text organi-sation
linguistic aspects (style, rhetorics)
CONSTRUCTING THE SEMANTIC DEEP STRUCTURE
generating knowledge elements
relating generated knowledge elements
- micro level set in relation
- macro level set in relation
revising the constructed semantic deep structure
- missing knowledge elements or relations
- contradic-tions within the semantic deep structure
- superfluous knowledge elements or relations

Transparency 4.1
Task Analysis & Construction of the Semantic Deep Structure


EXECUTIVE
LANGUAGE CODING
imposing a chronology on the semantic deep structure
formulating surface level sentences (building spoken text)
revising the surface level sentences (cohesion)
EXTERNAL REPRESENTATION OF PRODUCTS
symbolic/ iconic representation of knowledge elements
network representation of the semantic deep structure
hierarchical list representation of the semantic deep structure propositions
written text representation

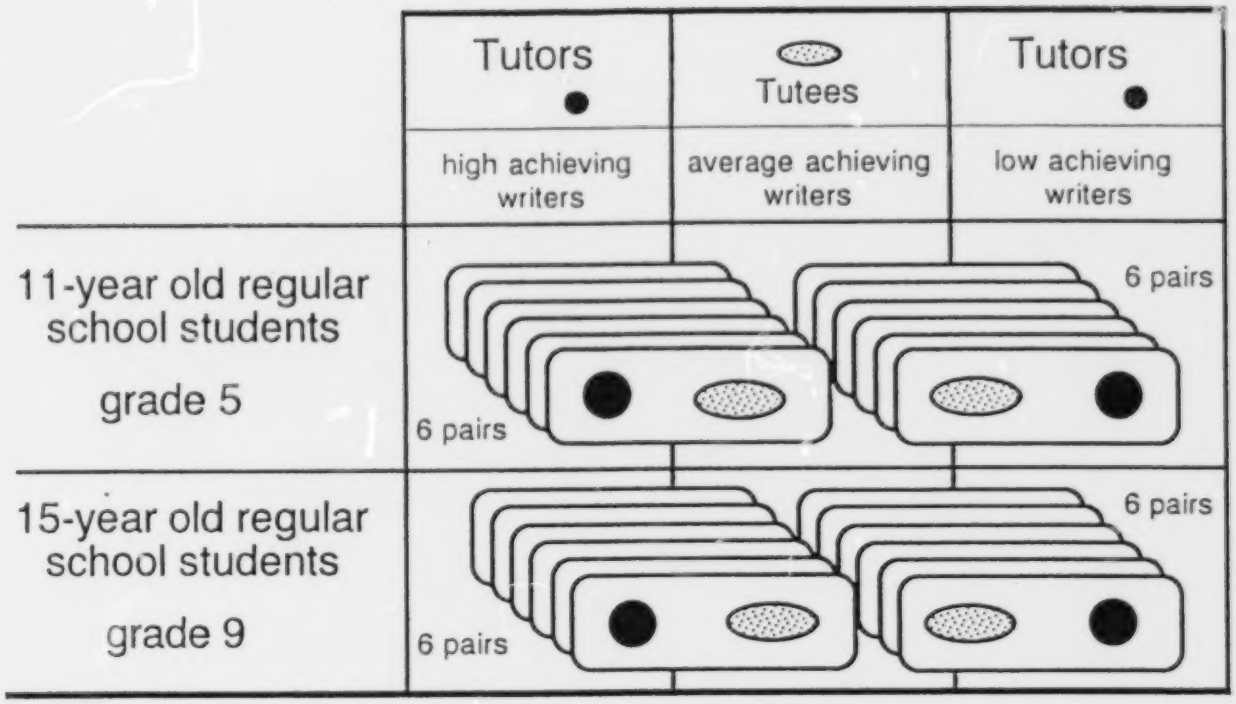

EVALUATING
the proper match of
writing assignment and text anticipation
text anticiption and semantic deep structure
semantic deep structure and text surface structure
text surface structure and linguistic aspects
final draft and text anticipation
EXECUTIVE

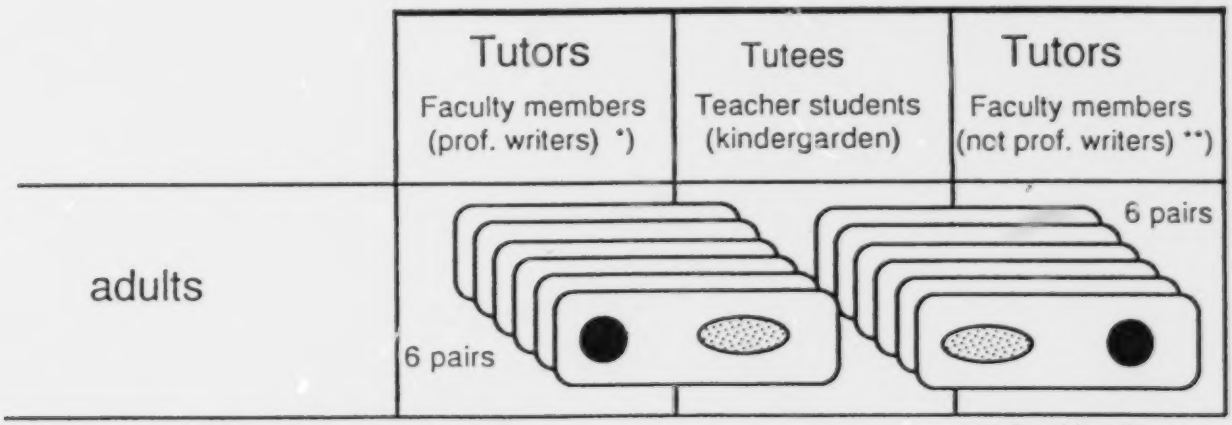
Transparency 4.3
Test Component



Transparency 4.4
Self Perception & Cognition

Experimental Design:



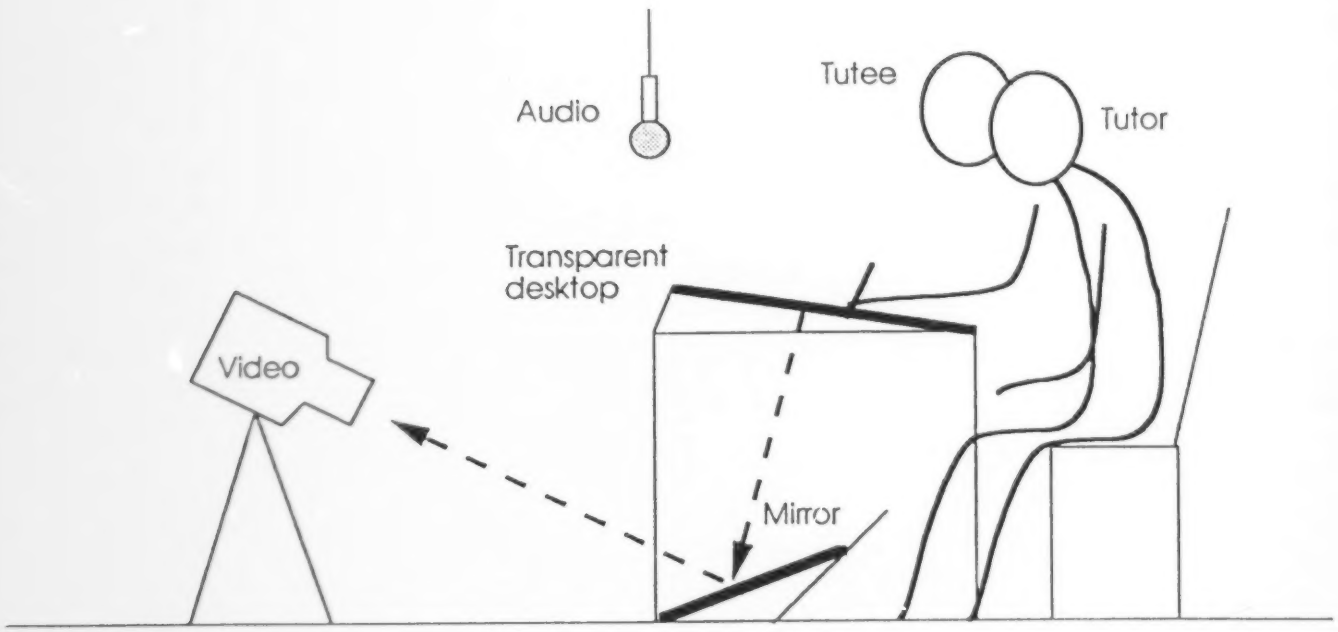


*) Teaching: Composition and Literature

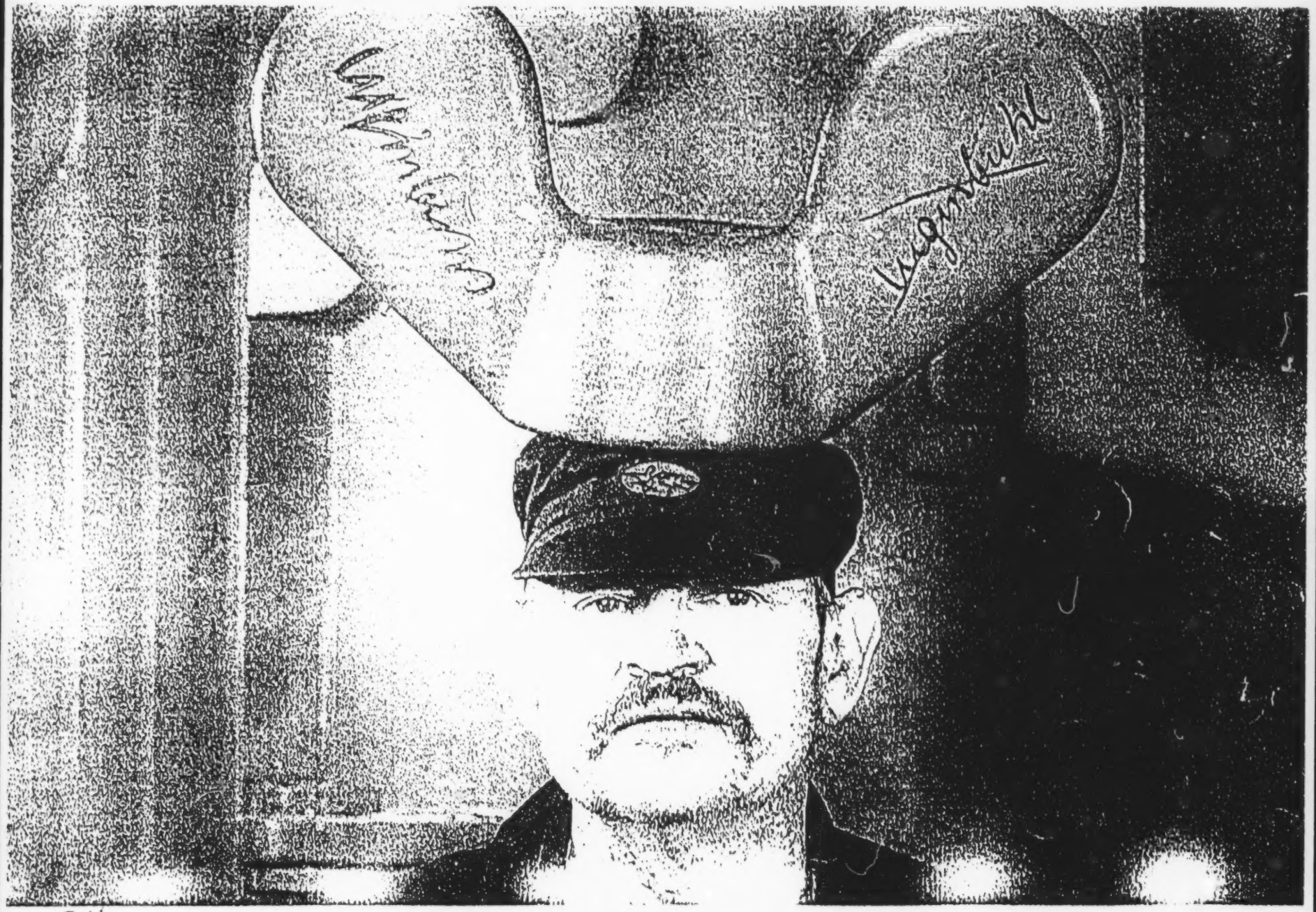
**) Teaching: Piano, Dance, Art (Painting), Gymnastics, Sports, Biology, Chemistry

Transparency 5

Experimental setup: Turku-table



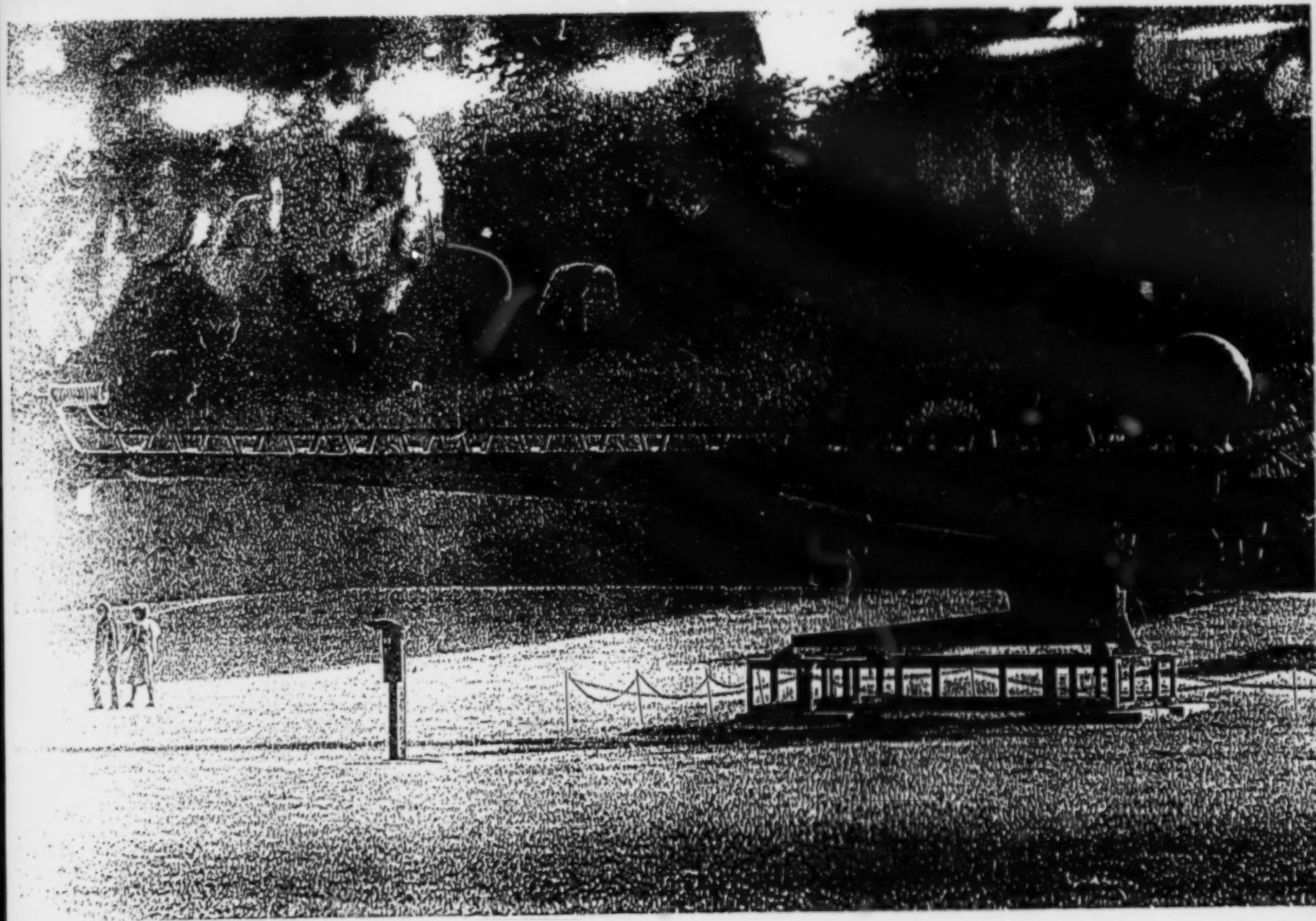
Transparency 6



24

anspcrency 7a

BEST COPY AVAILABLE



1975, EISEN, 1850 CM, MERIANPARK BASEL 1984, FOTO SIEGFRIED KUHN

Chronological Arrangement

Time	Tutor	Tutee
1. Session	1 Presentation of Video-tape and Pictures of the Iron-Sculptor Luginbühl and His Work 2 Writing an Informative Text About Luginbühl and His Work	
2. Session	1 2 Advising the Tutee About How to Write an Informative Text	Presentation of Video-tape and Pictures of the Iron-Sculptor Luginbühl and His Work Writing an Informative Text About Luginbühl and His Work with the Advice of the Tutor

Transparency 8

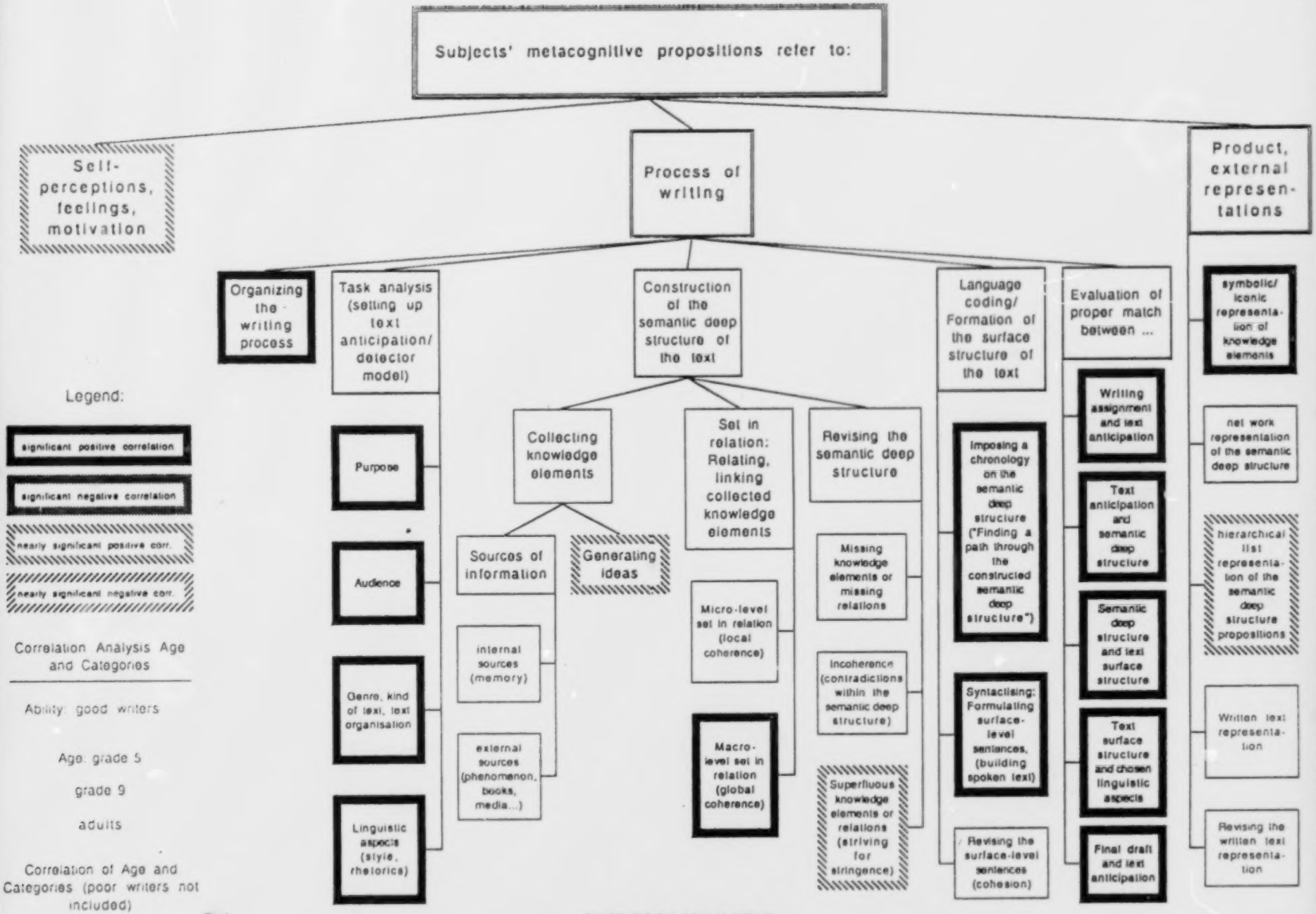
Subjects' metacognitive propositions refer to:
Self-perceptions, feelings, motivation
Process of writing
Product, external representations
Organising the writing process
Task analysis (setting up text anticipation/ detector model)
Purpose
Audience
Genre, kind of text, text organisation
Linguistic aspects (style, rhetorics)
Construction of the semantic deep structure of the text
Collecting knowledge elements
Sources of information
Generating ideas
internal sources (memory)
external sources (phenomenon, books, media ...)
Set in relation: Relating, linking collected knowledge elements
Micro-level set in relation (local coherence)
Macro-level set in relation (global coherence)
Revising the semantic deep structure
Missing knowledge elements or missing relations
Incoherence (contradictions within the semantic deep structure)
Superfluous knowledge elements or relations (striving for stringence)
Language coding/ Formation of the surface structure of the text
Imposing a chronology on the semantic deep structure ("Finding a path through the constructed semantic deep structure")
Syntactising: Formulating surface-level sentences, (building spoken text)
Revising the surface-level sentences (cohesion)
Evaluation of proper match between ...
Writing assignment and text anticipation
Text anticipation and semantic deep structure
Semantic deep structure and text surface structure
Text surface structure and chosen linguistic aspects
Final draft and text anticipation
symbolic/ iconic representation of knowledge elements
net work representation of the semantic deep structure
hierarchical list representation of the semantic deep structure propositions
Written text representation
Revising the written text representation

29

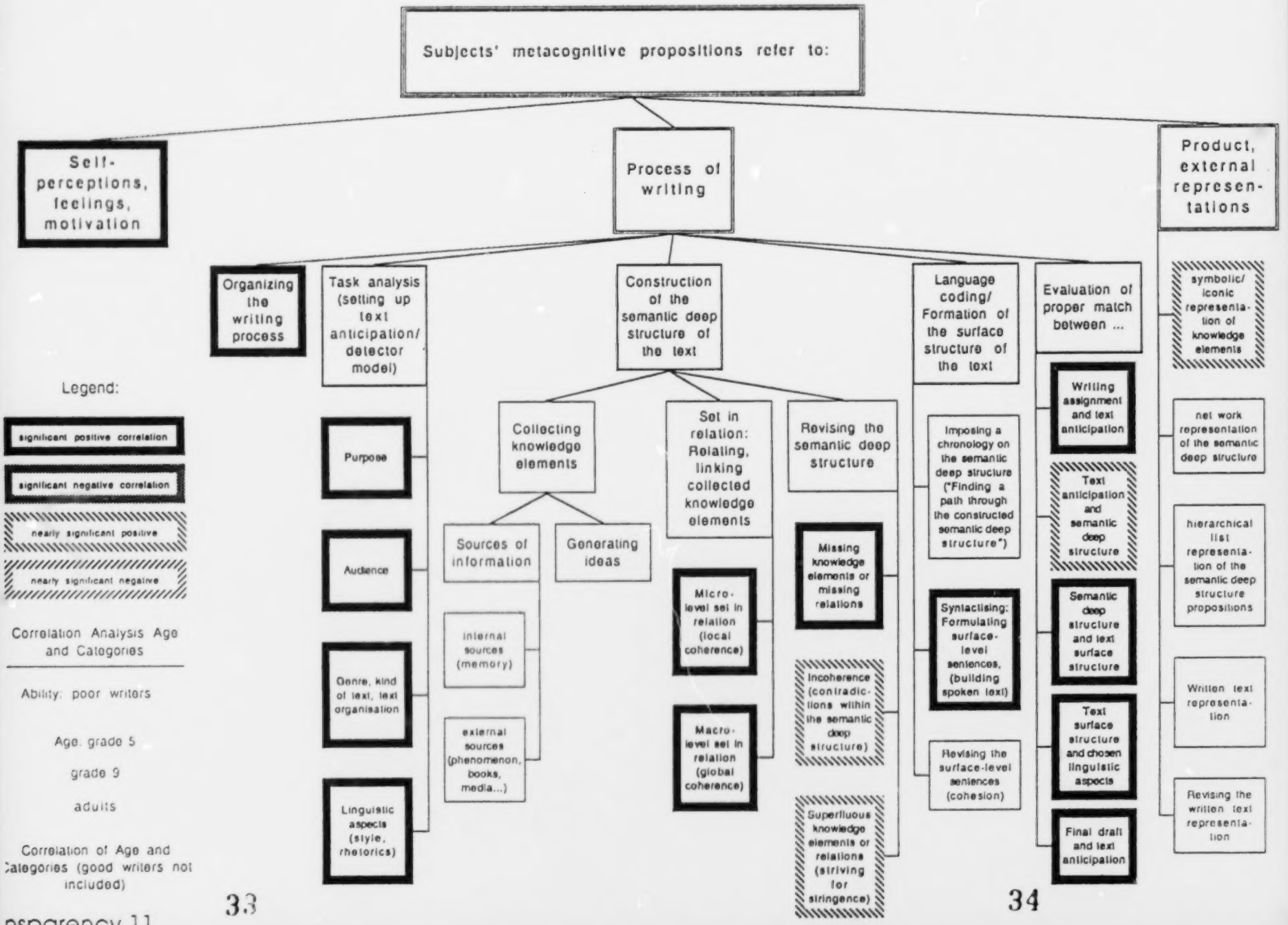
ansparency 9

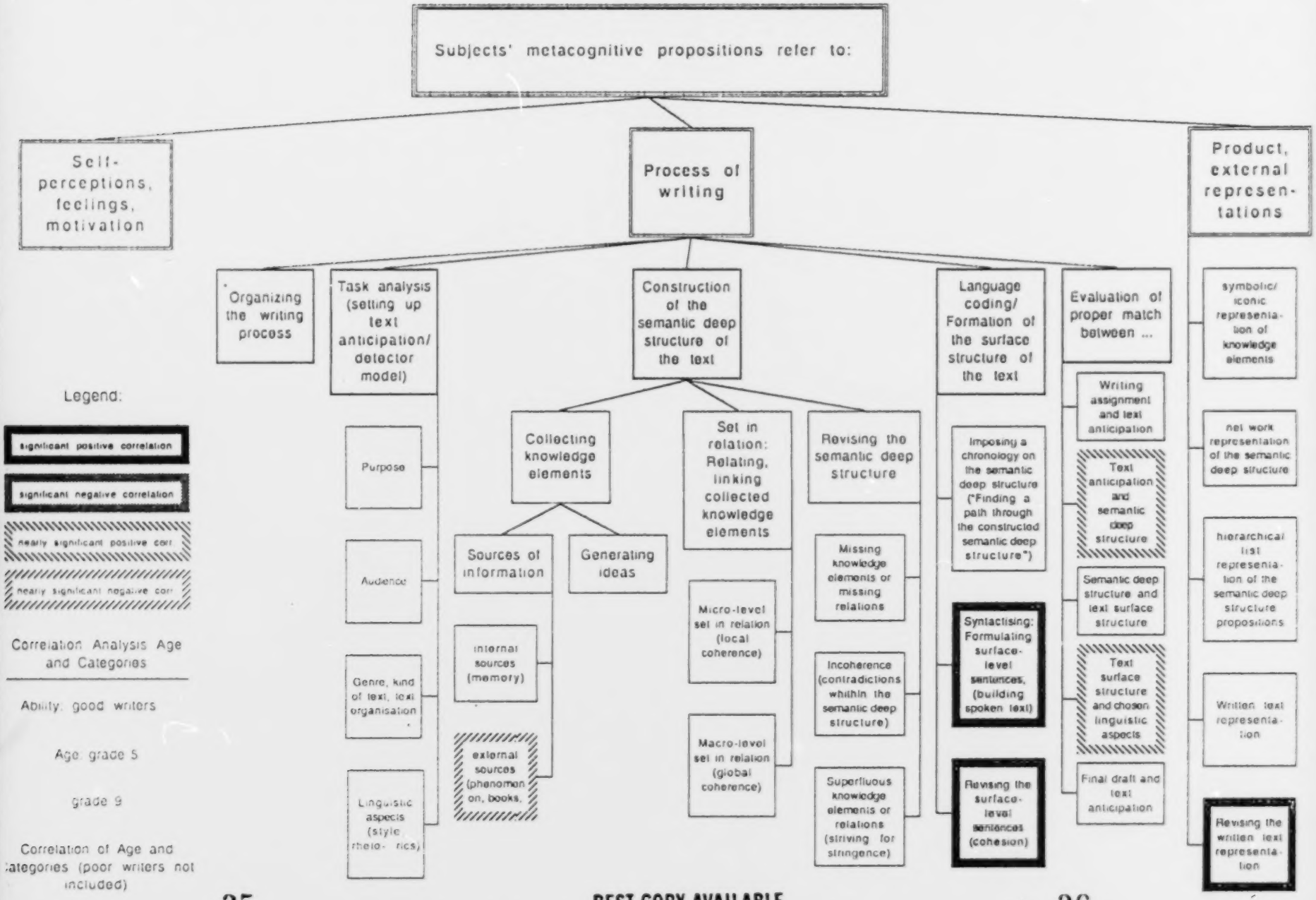
BEST COPY AVAILABLE

30

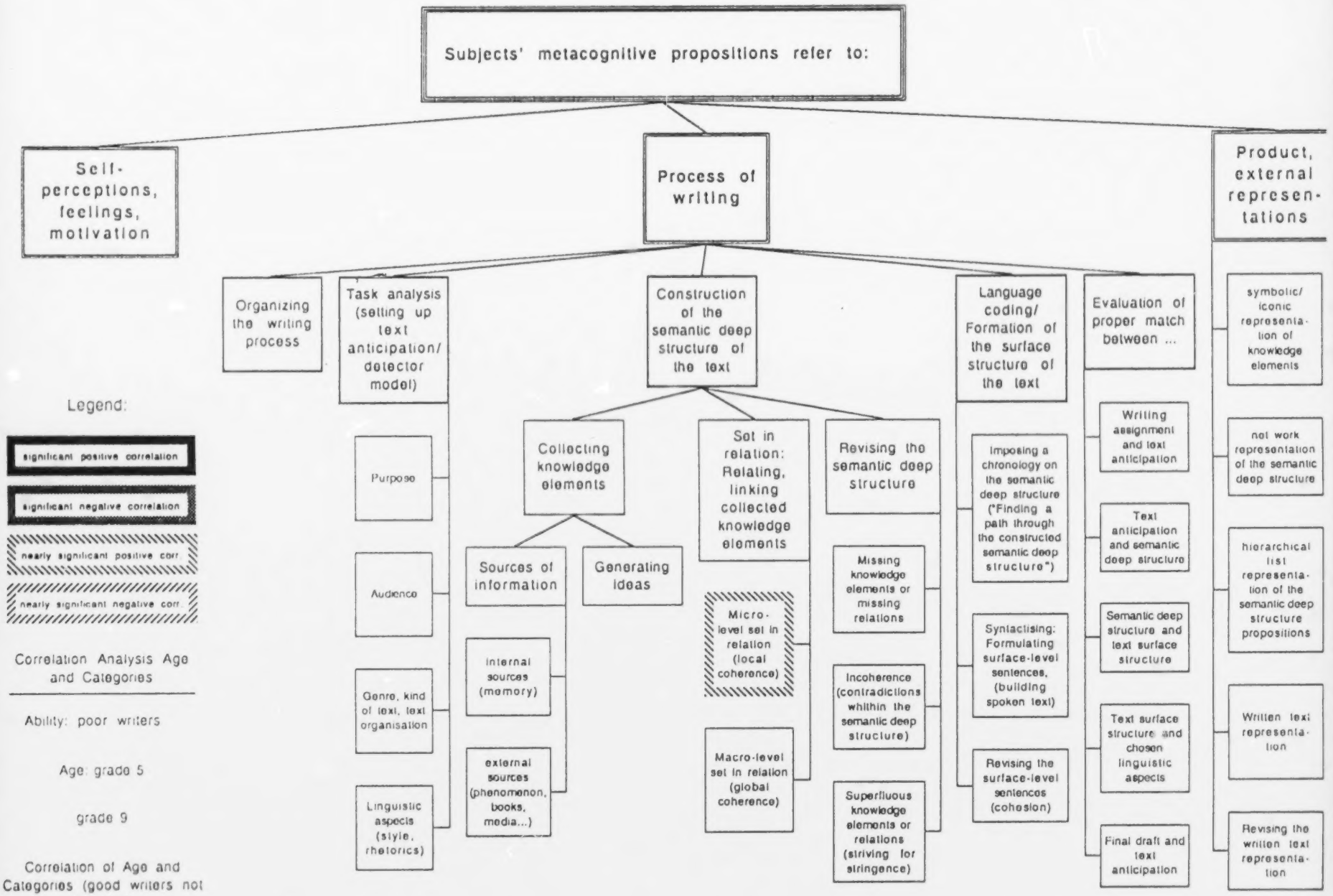

Subjects' metacognitive propositions refer to:
Self-perceptions, feelings, motivation
Process of writing
Product, external representations
Organizing the writing process
Task analysis (setting up text anticipation/ detector model)
Construction of the semantic deep structure of the text
Language coding/ Formation of the surface structure of the text
Evaluation of proper match between ...
Purpose
Audience
Genre, kind of text, text organisation
Linguistic aspects (style, rhetorics)
Collecting knowledge elements
Sources of information
Generating ideas
internal sources (memory)
external sources (phenomenon, books, media...)
Set in relation: Relating, linking collected knowledge elements
Micro-level set in relation (local coherence)
Macro-level set in relation (global coherence)
Revising the semantic deep structure
Missing knowledge elements or missing relations
Incoherence (contradictions within the semantic deep structure)
Superfluous knowledge elements or relations (striving for stringence)
Imposing a chronology on the semantic deep structure ("Finding a path through the constructed semantic deep structure")
Syntactising: Formulating surface-level sentences, (building spoken text)
Revising the surface-level sentences (cohesion)
Writing assignment and text anticipation
Text anticipation and semantic deep structure
Semantic deep structure and text surface structure
Text surface structure and chosen linguistic aspects
Final draft and text anticipation
symbolic/ iconic representation of knowledge elements
net work representation of the semantic deep structure
hierarchical list representation of the semantic deep structure propositions
Written text representation
Revising the written text representation
Legend:
significant positive correlation
significant negative correlation
nearly significant positive corr.
nearly significant negative corr.
Correlation Analysis Age and Categories
Ability: good writers
Age: grade 5
grade 9
adults
Correlation of Age and Categories (poor writers not included)

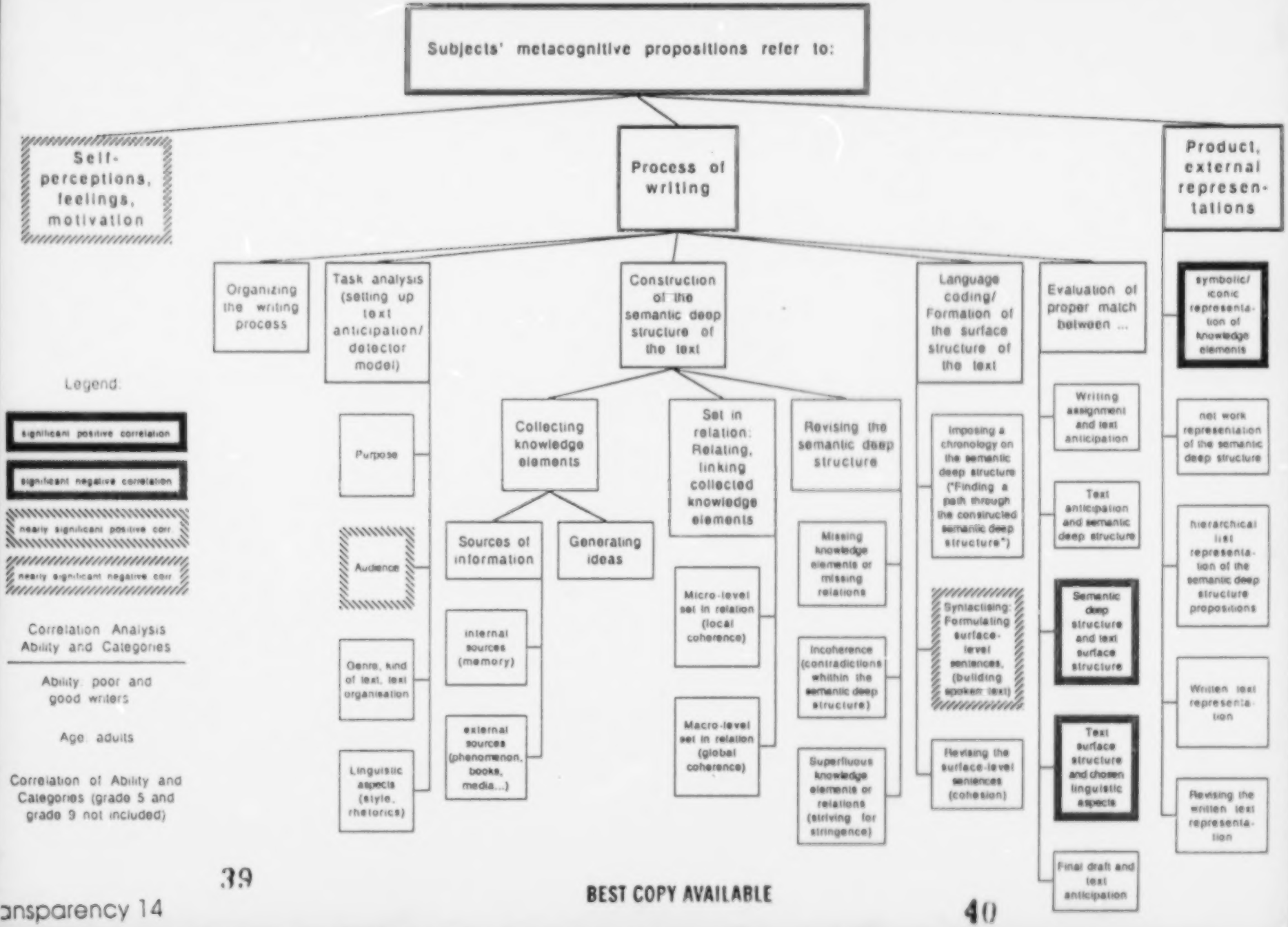
BEST COPY AVAILABLE


Subjects' metacognitive propositions refer to:
Self-perceptions, feelings, motivation
Process of writing
Product, external representations
Organizing the writing process
Task analysis (setting up text anticipation/ detector model)
Construction of the semantic deep structure of the text
Language coding/ Formation of the surface structure of the text
Evaluation of proper match between ...
Purpose
Audience
Genre, kind of text, text organisation
Linguistic aspects (style, rhetorics)
Collecting knowledge elements
Sources of information
Generating ideas
internal sources (memory)
external sources (phenomenon, books, media...)
Set in relation: Relating, linking collected knowledge elements
Micro-level set in relation (local coherence)
Macro-level set in relation (global coherence)
Revising the semantic deep structure
Missing knowledge elements or missing relations
Incoherence (contradictions within the semantic deep structure)
Superfluous knowledge elements or relations (striving for stringence)
Imposing a chronology on the semantic deep structure ("Finding a path through the constructed semantic deep structure")
Syntactising: Formulating surface-level sentences, (building spoken text)
Revising the surface-level sentences (cohesion)
Writing assignment and text anticipation
Text anticipation and semantic deep structure
Semantic deep structure and text surface structure
Text surface structure and chosen linguistic aspects
Final draft and text anticipation
symbolic/ iconic representation of knowledge elements
net work representation of the semantic deep structure
hierarchical list representation of the semantic deep structure propositions
Written text representation
Revising the written text representation
Legend:
significant positive correlation
significant negative correlation
nearly significant positive
nearly significant negative
Correlation Analysis Age and Categories
Ability: poor writers
Age: grade 5
grade 9
adults
Correlation of Age and Categories (good writers not included)

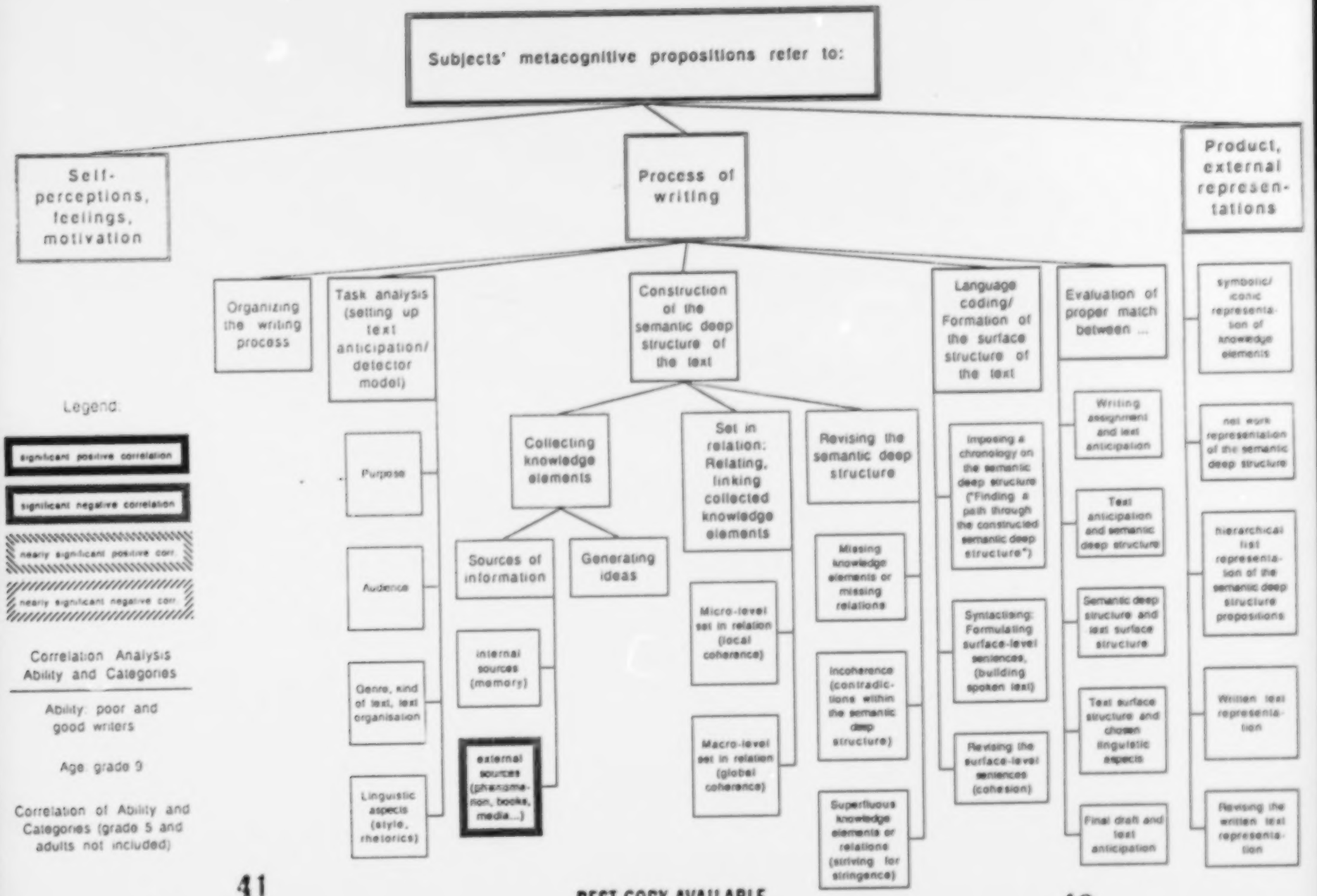

Subjects' metacognitive propositions refer to:
Self-perceptions, feelings, motivation
Process of writing
Product, external representations
Organizing the writing process
Task analysis (setting up text anticipation/ detector model)
Construction of the semantic deep structure of the text
Language coding/ Formation of the surface structure of the text
Evaluation of proper match between ...
Purpose
Audience
Genre, kind of text, text organisation
Linguistic aspects (style rheto- rics)
Collecting knowledge elements
Sources of information
Generating ideas
internal sources (memory)
external sources (phenomon on, books,
Set in relation: Relating, linking collected knowledge elements
Micro-level set in relation (local coherence)
Macro-level set in relation (global coherence)
Revising the semantic deep structure
Missing knowledge elements or missing relations
Incoherence (contradictions whithin the semantic deep structure)
Superfluous knowledge elements or relations (striving for stringence)
Imposing a chronology on the semantic deep structure ("Finding a path through the constructed semantic deep structure")
Syntactising: Formulating surface-level sentences, (building spoken text)
Revising the surface-level sentences (cohesion)
Writing assignment and text anticipation
Text anticipation and semantic deep structure
Semantic deep structure and text surface structure
Text surface structure and chosen linguistic aspects
Final draft and text anticipation
symbolic/ iconic representation of knowledge elements
net work representation of the semantic deep structure
hierarchical list representation of the semantic deep structure propositions
Written text representation
Revising the written text representation
Legend:
significant positive correlation
significant negative correlation
nearly significant positive corr.
nearly significant negative corr.
Correlation Analysis Age and Categories
Ability: good writers
Age: grade 5
grade 9
Correlation of Age and Categories (poor writers not included)

BEST COPY AVAILABLE


Subjects' metacognitive propositions refer to:
Self-perceptions, feelings, motivation
Process of writing
Product, external representations
Organizing the writing process
Task analysis (setting up text anticipation/ detector model)
Construction of the semantic deep structure of the text
Language coding/ Formation of the surface structure of the text
Evaluation of proper match between ...
Purpose
Audience
Genre, kind of text, text organisation
Linguistic aspects (style, rhetorics)
Collecting knowledge elements
Sources of information
Generating ideas
internal sources (memory)
external sources (phenomenon, books, media...)
Set in relation: Relating, linking collected knowledge elements
Micro-level set in relation (local coherence)
Macro-level set in relation (global coherence)
Revising the semantic deep structure
Missing knowledge elements or missing relations
Incoherence (contradictions whithin the semantic deep structure)
Superfluous knowledge elements or relations (striving for stringence)
Imposing a chronology on the semantic deep structure ("Finding a path through the constructed semantic deep structure")
Syntactising: Formulating surface-level sentences, (building spoken text)
Revising the surface-level sentences (cohesion)
Writing assignment and text anticipation
Text anticipation and semantic deep structure
Semantic deep structure and text surface structure
Text surface structure and chosen linguistic aspects
Final draft and text anticipation
symbolic/ iconic representation of knowledge elements
not work representation of the semantic deep structure
hierarchical list representation of the semantic deep structure propositions
Written text representation
Revising the written text representation
Legend:
significant positive correlation
significant negative correlation
nearly significant positive corr.
nearly significant negative corr.
Correlation Analysis Age and Categories
Ability: poor writers
Age: grade 5
grade 9
Correlation of Age and Categories (good writers not included)

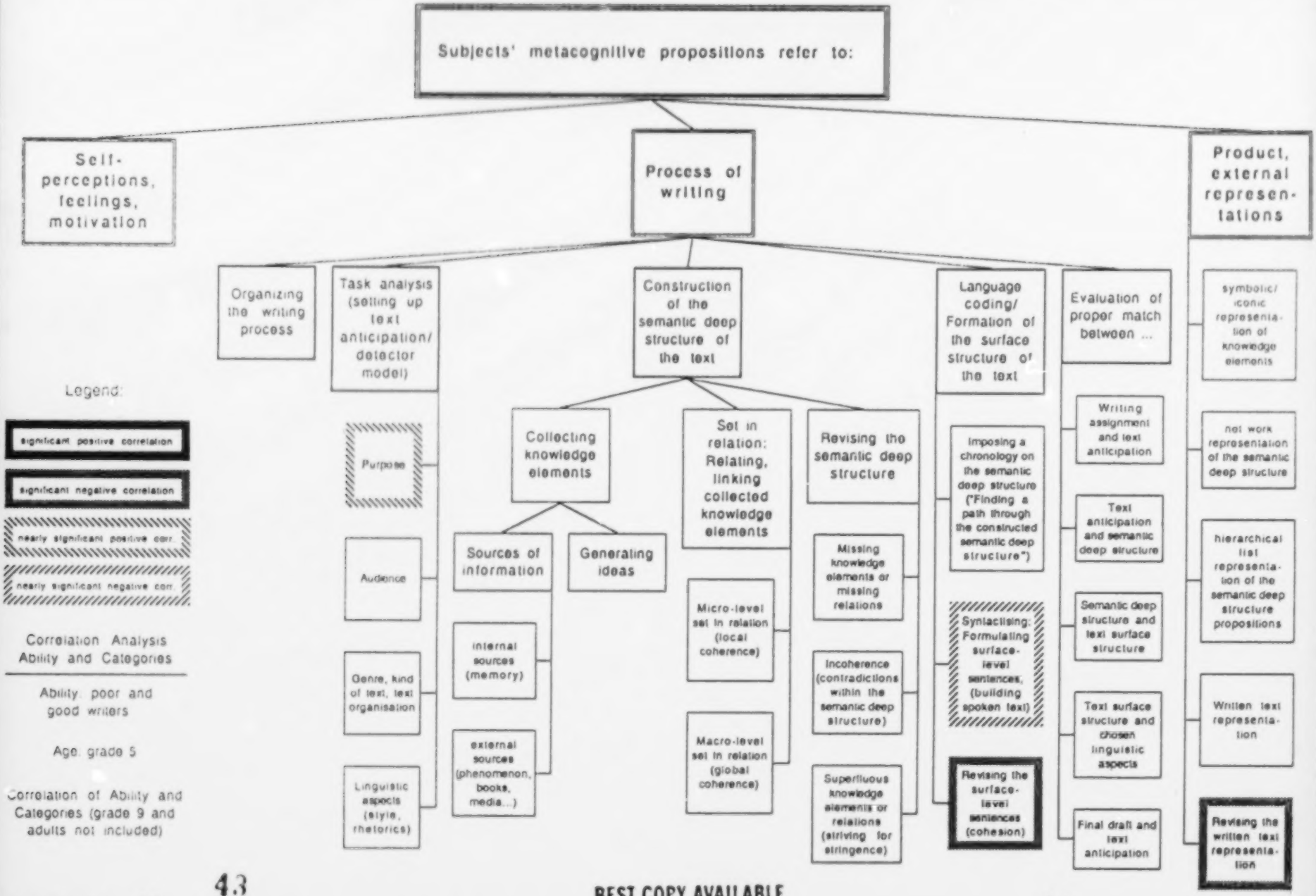

Subjects' metacognitive propositions refer to:
Self-perceptions, feelings, motivation
Process of writing
Product, external representations
Organizing the writing process
Task analysis (setting up text anticipation/ detector model)
Construction of the semantic deep structure of the text
Language coding/ Formation of the surface structure of the text
Evaluation of proper match between ...
symbolic/ iconic representation of knowledge elements
net work representation of the semantic deep structure
hierarchical list representation of the semantic deep structure propositions
Written text representation
Revising the written text representation
Purpose
Audience
Genre, kind of text, text organisation
Linguistic aspects (style, rhetorics)
Collecting knowledge elements
Sources of information
Generating ideas
internal sources (memory)
external sources (phenomenon, books, media...)
Set in relation: Relating, linking collected knowledge elements
Micro-level set in relation (local coherence)
Macro-level set in relation (global coherence)
Revising the semantic deep structure
Missing knowledge elements or missing relations
Incoherence (contradictions whithin the semantic deep structure)
Superfluous knowledge elements or relations (striving for stringence)
Imposing a chronology on the semantic deep structure ("Finding a path through the constructed semantic deep structure")
Syntactising: Formulating surface-level sentences, (building spoken text)
Revising the surface-level sentences (cohesion)
Writing assignment and text anticipation
Text anticipation and semantic deep structure
Semantic deep structure and text surface structure
Text surface structure and chosen linguistic aspects
Final draft and text anticipation
Legend:
significant positive correlation
significant negative correlation
nearly significant positive corr.
nearly significant negative corr.
Correlation Analysis Ability and Categories
Ability: poor and good writers
Age: adults
Correlation of Ability and Categories (grade 5 and grade 9 not included)

BEST COPY AVAILABLE


Subjects' metacognitive propositions refer to:
Self-perceptions, feelings, motivation
Process of writing
Product, external representations
Organizing the writing process
Task analysis (setting up text anticipation/ detector model)
Construction of the semantic deep structure of the text
Language coding/ Formation of the surface structure of the text
Evaluation of proper match between ...
Purpose
Audience
Genre, kind of text, text organisation
Linguistic aspects (style, rhetorics)
Collecting knowledge elements
Sources of information
Generating ideas
internal sources (memory)
external sources (phenomenon, books, media...)
Set in relation: Relating, linking collected knowledge elements
Micro-level set in relation (local coherence)
Macro-level set in relation (global coherence)
Revising the semantic deep structure
Missing knowledge elements or missing relations
Incoherence (contradictions within the semantic deep structure)
Superfluous knowledge elements or relations (striving for stringence)
Imposing a chronology on the semantic deep structure ("Finding a path through the constructed semantic deep structure")
Syntactising: Formulating surface-level sentences, (building spoken text)
Revising the surface-level sentences (cohesion)
Writing assignment and text anticipation
Text anticipation and semantic deep structure
Semantic deep structure and text surface structure
Text surface structure and chosen linguistic aspects
Final draft and text anticipation
symbolic/ iconic representation of knowledge elements
net work representation of the semantic deep structure
hierarchical list representation of the semantic deep structure propositions
Written text representation
Revising the written text representation
Legend:
significant positive correlation
significant negative correlation
nearly significant positive corr.
nearly significant negative corr.
Correlation Analysis Ability and Categories
Ability: poor and good writers
Age: grade 9
Correlation of Ability and Categories (grade 5 and adults not included)

BEST COPY AVAILABLE

Transparency 15


Subjects' metacognitive propositions refer to:
Self-perceptions, feelings, motivation
Process of writing
Product, external representations
Organizing the writing process
Task analysis (setting up text anticipation/ detector model)
Construction of the semantic deep structure of the text
Language coding/ Formation of the surface structure of the text
Evaluation of proper match between ...
Purpose
Audience
Genre, kind of text, text organisation
Linguistic aspects (style, rhetorics)
Collecting knowledge elements
Sources of information
Generating ideas
internal sources (memory)
external sources (phenomenon, books, media...)
Set in relation: Relating, linking collected knowledge elements
Micro-level set in relation (local coherence)
Macro-level set in relation (global coherence)
Revising the semantic deep structure
Missing knowledge elements or missing relations
Incoherence (contradictions within the semantic deep structure)
Superfluous knowledge elements or relations (striving for stringence)
Imposing a chronology on the semantic deep structure ("Finding a path through the constructed semantic deep structure")
Syntactising: Formulating surface-level sentences, (building spoken text)
Revising the surface-level sentences (cohesion)
Writing assignment and text anticipation
Text anticipation and semantic deep structure
Semantic deep structure and text surface structure
Text surface structure and chosen linguistic aspects
Final draft and text anticipation
symbolic/ iconic representation of knowledge elements
not work representation of the semantic deep structure
hierarchical list representation of the semantic deep structure propositions
Written text representation
Revising the written text representation
Legend:
significant positive correlation
significant negative correlation
nearly significant positive corr.
nearly significant negative corr.
Correlation Analysis Ability and Categories
Ability: poor and good writers
Age: grade 5
Correlation of Ability and Categories (grade 9 and adults not included)

BEST COPY AVAILABLE